

# Strategic Choice in Developing Telemedicine - Observations from Three Organizations

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**December 2019**



**Rural Health Research  
& Policy Centers**

Funded by the Federal Office of Rural Health Policy  
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## Acknowledgements

This project was supported by the Federal Office of Rural Health Policy (FORHP), Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services (HHS) under cooperative agreement/grant #U1C RH20419. Early contributors to the project included three graduate students working for the RUPRI Center at the time: Matt Nattinger, Nora Kipping, and Megan La Suer. We are grateful to Sue Nardie for her expert editing. The information, conclusions and opinions expressed in this document are those of the authors, and no endorsement by FORHP, HRSA, or HHS is intended or should be inferred.

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## Key Findings

Themes from the literature review:

1. Several specific specialty services greatly benefit rural areas, such as tele-ED (emergency), tele-stroke, and tele-ICU (intensive care unit).
2. While some organizations have been able to effectively scale telemedicine to reach revenue neutrality or even net revenue generation, the scale required to do so is significant.
3. Strategic and operational challenges include demonstrating the value of telemedicine programs within the organization, resistance from clinicians, and adapting physician contracts.

Themes from the case studies:

1. In markets where access to certain specialty services are difficult to obtain or develop because of insufficient patient volume or inability to recruit providers, telemedicine offers a solution.
2. Service development has been primarily organic: addressing specific community requests and needs and/or fostered by physicians with a strong belief in the efficacy of telemedicine.
3. All three organizations consider telemedicine more as a cost minimization strategy than as a strong revenue generator.
4. The three organizations noted that the introduction and growth of telemedicine services also presents a number of new challenges, including staffing and technology issues.
5. All three organizations are considering the future of their telemedicine services, including service expansion in both scope and geography.

## Introduction and Purpose

Access to appropriate health care services in rural and remote communities in the U.S. continues to be a challenge. One way in which health systems have been able to increase access to health care services in rural communities is through telemedicine<sup>1</sup> programs (Dorsey and Topol, 2016). While advances in technology and mobile communication have made it easier to provide telemedicine services, the actual value of telemedicine programs has not been rigorously established for the health systems providing services (host organizations) or for patients, The strategic thinking underlying organizations' decisions to develop telemedicine programs is also largely unexplored (Aldossary et al., 2017).

The purpose of this project was to explore organizational motivations for incorporating telemedicine into their patient care services. Business considerations such as local and regional market conditions, and system and regional economics may be important for these decisions (Huilgol et al., 2019). However, patient care considerations such as provision of optimal care, ease of access, and impact on personal finance are also thought to play a role (Lin et al., 2018). We conducted a literature review and

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<sup>1</sup> The terms 'telemedicine' and 'telehealth' are frequently used nearly interchangeably. The focus in this paper is on hospitals providing clinical services at a distance using technology and so we use the term 'telemedicine'. "Telemedicine refers specifically to remote clinical services, while telehealth can refer to remote non-clinical services." (AAFP, 2019)

then interviewed informants at three organizations to explore their organizations' strategies and their approach for engaging in telemedicine to support rural health care. Our interviews explored the organizations' business considerations as well as their intended contributions to improving patient care in resource-challenged rural communities.

## Literature

A non-exhaustive review of recent literature explored the rationale for providing telemedicine in rural sites. Three themes arose from this literature review. The most prominent theme is that telemedicine allows host organizations to provide specialty care to inhabitants of rural areas where there are shortages of specialists, thus allowing patients to remain near their homes while avoiding travel on the part of providers (Adler-Milstein, Kvedar, and Bates, 2014; Kvedar, Coye, and Everett, 2014; Mace, 2016, Ward et al., 2016, Natafji et al., 2019). A second theme is that host organizations struggle to achieve a positive financial return on investment (ROI) from telemedicine. Rather, they use it as a mechanism to develop or enhance referral relationships with rural providers for specialty services. Third, telemedicine programs can face a number of strategic and operational challenges to implementation and expansion. For example, physician resistance (Alverson, Shannon, Sullivan, et al., 2004; Kvedar, Coye, and Everett, 2014) is often cited as a potential barrier, but physician champions can also drive the development of telemedicine services (Kvedar, Coye, and Everett, 2014; Shannon, Bashshur, Kratochwill, et al., 2005).

### **Literature Theme: Specialty Care Services**

The literature noted several specific specialty services that can greatly benefit rural areas, such as tele-ED (emergency), tele-stroke, and tele-ICU (intensive care unit) (Ward et al., 2015). Tele-ED services for rural communities are seen as one way to mitigate ED staffing challenges due to physician shortages (Ward et al., 2018). Moss and Larson (2017) argue that forward-thinking systems are "building tech-enabled AP [advanced practice] provider solutions to meet access needs and optimize their workforce through top of license practice (pg. 3)." Kvedar, Coye and Everett (2014) make a similar argument, positing that telemedicine allows non-physician provider "team members to practice at their highest levels of skill and training (pg. 195)." Tele-stroke services provided by remote neurologists have particular clinical value by speeding up the determination of whether to administer a thrombolytic agent, tPA (Adler-Milstein, Kvedar, and Bates, 2014; Mace, 2016). Several authors argue for the clinical advantages of tele-ICUs, especially given the lack of intensivists available in the U.S. generally and especially in rural areas (Adler-Milstein, Kvedar, and Bates, 2014; Beck, 2016; Kvedar, Coye, and Everett, 2014).

### **Literature Theme: Financial Concerns**

The literature includes few references to a positive ROI for the host organization (Mackinney et al., 2015). While some organizations have been able to effectively scale telemedicine to reach revenue neutrality or even net revenue generation, the scale required to do so is significant (Effertz, Alverson, Dion, et al., 2017). Several authors commented on the importance of grants or other external funding for facilitating the creation of telehealth and telemedicine programs (Alverson, Shannon, Sullivan, et al., 2004; Effertz, Alverson, Dion, et al., 2017; Shannon, Bashshur, Kratochwill, et al., 2005). While charges for telemedicine network membership, clinical services, and per-encounter charges may cover direct costs, it is very difficult to generate enough revenue to build a robust program with a positive bottom line (Effertz, Alverson, Dion, et al., 2017). For some services, such as tele-ED or tele-ICU, quality is often the driver (Beck, 2016; Kvedar, Coye, and Everett, 2014), though several studies have shown significant

savings as well as quality improvement in ICU care through tele-ICU services (Beck, 2016; Kvedar, Coye, and Everett, 2014). In addition, provisions of the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA) reward the use of telehealth and remote patient monitoring for care coordination (Greenspun, Korba and Kane, 2016; Mehrotra, Huskamp, Souza, et al., 2017). Despite the lack of a strong financial case for telemedicine to date, strategic reasons may justify providing this service. First, as alternative payment models continue to push greater financial risk towards providers and health systems, delivering care in the most cost effective manner makes telemedicine a more attractive consideration for organizations with a large geographic service area (Natafagi et al., 2018). Under capitation models, telemedicine can be significantly cheaper and be a major satisfier for beneficiaries. The role of telemedicine in bundled payment programs is an area worth study. Second, host organizations providing this service to rural providers may generate a stream of referrals from those providers for services not available locally, strengthening market share for the host hospital (Alverson, Shannon, Sullivan, et al., 2004; Effertz, Alverson, Dion, et al., 2017). Third, some less complex services can be effectively coordinated between the host hospital and the client organization, potentially freeing up capacity at the host hospital for more complex (and financially positive) cases. In addition, avoiding specialist travel to rural hospitals increases their clinical time available for additional patients. Finally, travel costs for patients can be reduced through effective telemedicine programs, increasing patient satisfaction and affinity for using local providers.

### **Literature Theme: Strategic and Operational Challenges**

Alverson, Shannon, Sullivan et al. (2004) provide some cautionary notes regarding establishing telemedicine based on their experience creating the University of New Mexico Telehealth Network. First, they had assumed that the value of this kind of program was self-evident. Further, they did not expect the level of resistance that they encountered from clinicians, as well as some administrators. Based on their experience they identify several critical challenges to establishing a telemedicine network. These include the following:

- Inadequate strategic and business planning
- Lack of focus on areas of greatest potential success, for example, sufficient and/or high potential volume, existing champions at the hub and spokes, clinical effectiveness, cost effectiveness
- Low reimbursement rates and/or lack of commitment for reimbursement
- No persuasive case for ROI
- Competition and reluctance to collaborate
- Inadequate supply pool of specialty providers who are willing to participate
- Rapid turnover of health care professionals in both provider and administrative roles
- Emergence of for-profit entities
- Weak economy in rural sites

Finally, when Alverson and colleagues examined their utilization data, they found that not very many patients from remote sites who came to Albuquerque actually went to the hub site. They were going to other facilities in the Albuquerque area.

Other challenges include adapting physician contracts to the new type of care delivery. For example, if a physician is engaging in telemedicine consultations from her home, is the time considered covered by her salary, or is she paid an on-call rate, or is she compensated on a per consult basis? In addition, these

services can be costly for the originating site. Gaining an accurate assessment of the access improvements and patient satisfaction from implementing telemedicine takes time. Further, inertia can exist in the form of policy challenges at both the State and Federal level related to licensing and credentialing as well as reimbursement for telemedicine services.

## Interview Background

We selected Kaiser Permanente Southern California (Kaiser), the Mayo Clinic Center for Connected Care (Mayo) and the University of Mississippi Medical Center (UMMC) as a convenience sample, in part because they represent different missions and financial models. UMMC is the only academic medical center in that state and, as a State institution, has a special expectation to provide for the needs of the entire state. Kaiser, based in Oakland, California, is a capitated, integrated health care delivery system operating on a regionalized basis. Mayo is a not-for-profit, physician-driven system operating primarily in Minnesota, with satellite branches in Florida and Arizona. Thus, the strategic reasons for, and approach to, engaging in telemedicine for these three organizations might be expected to differ. This paper explores how geographic access to services, cost minimization, and growth models have influenced the development of the three organizations' telemedicine programs. With these three case studies, we hope to advance our understanding of organizations' decisions, which can guide future research as well as help other organizations in their strategic considerations regarding the adoption of telemedicine programs.

Interviews with key informants at the three organizations were conducted (and recorded) via telephone from May through September 2016. Recordings were transcribed, and the resulting documents were reviewed by project members for development of topical themes. Interviewees consented to the use of their comments (without attribution). The University of Iowa Institutional Review Board determined that the project did not meet the regulatory definition of human subjects research and did not require further review.

The focus of the interviews was on synchronous (real-time) services, though it should be noted that all three organizations also provide asynchronous (delayed, also called store-and-forward) services, such as tele-dermatology.

### Kaiser

There are seven California regions within the Kaiser Permanente System. The Southern California region has recently experienced significant membership growth, most of it in areas distant from the core facilities. The discussion with the informants focused on the provision of behavioral health, TeleStroke, and dermatology services.

Kaiser began piloting telemedicine services in approximately 2010 without a clear strategy for growth. Telemedicine services were offered only in geographic areas where it was difficult to recruit specialist physicians. More recently, Kaiser has begun identifying current telemedicine services that have a value add. For a service that has high demand and high value in certain geographic service areas, Kaiser plans to implement the service broadly across the entire region. While Kaiser's initial objective was to improve access to care, they have begun to take a closer look at the program workflow to determine both whether the goal of improved access is being accomplished and how to make telemedicine services more efficient.

## Mayo

Mayo provides telemedicine through their Center for Connected Care (the Center). The purpose of the Center is to provide specialty services in areas that are some distance from Mayo's larger hospitals in order to keep patients in their home community and reduce travel burden for both patients and providers.

The Center has been in place since about 2011 and serves patients throughout the Mayo Network, which serves roughly 72 communities in Wisconsin, Minnesota, and Iowa. The Mayo Network also has 34 affiliates. We report here on the Rochester, Minnesota, medical center location and its hub sites in Wisconsin in Mankato, La Crosse, and Eau Claire.

Mayo began with a patient portal and then developed a consult service for asynchronous consultation between specialists and between primary care and specialists. At the time of interview, Mayo's focus was on tele-stroke, tele-ED, and tele-neonatology.

## UMMC

UMMC services 218 telemedicine sites across the state in 64 of Mississippi's 82 counties, excluding services in patient homes. UMMC's telemedicine program serves eight different types of sites: hospitals; clinics; Rural Health Clinics; mental health clinics; Federally Qualified Health Centers; the State prisons, colleges, and universities; corporations; and patients' homes. All organizational sites are served on a contractual basis.

The main services discussed during the interview were tele-ED, tele-psychiatry, and tele-dermatology. UMMC also offers tele-neonatology, corporate urgent care, and chronic care management in the home. UMMC offers tele-ICU only within its own main campus and at one of its two satellite hospitals.

## Interview Findings

Three themes that emerged from the interviews paralleled those found in the review of literature. First, each of the organizations initially focused on geographic access to specialty services in areas where they found it difficult to recruit physicians in certain specialties. Second, the growth was initially driven more organically, by needs identified by providers in specific geographic areas for specialty services that could keep patients in their home communities, rather than by identified strategic priorities, such as protecting market share or increasing referrals. Third, these organizations now appear to be taking a more strategic view regarding their future expansion. For example, all three organizations are focusing on remote monitoring. This is likely to reduce the travel burden for patients while also generating revenue. As capitation and other alternative payment approaches, such as bundled payment, become more prevalent, this technology may also be an intervention mechanism to prevent hospitalization.

Two additional themes were identified from the interviews. All three organizations identified staffing and equipment issues that the growth of telehealth services has introduced. And finally, the three organizations provided some insight into their future plans for telehealth.

Below, we discuss the activities of each organization as they relate to the three identified themes: geographic access to specialty services, organic versus strategic growth, and cost minimization and market protection versus revenue generation. We then discuss some operational issues the sites shared, and end with their future plans.

### **Interview Theme: Geographic Access to Specialty Services**

In markets where access to certain specialty services are difficult to obtain or develop because of insufficient patient volume or inability to recruit providers, telemedicine offers a solution.

#### Kaiser

Kaiser experienced difficulty delivering face-to-face dermatology, behavioral health, and other specialty care in certain locations due to recruitment challenges. Through telemedicine, Kaiser can provide care without requiring specialty providers to travel and without beneficiaries having to leave their local site of care. Informants stated, "most of the use cases that we originally started out with in terms of telehealth were really based on geographic needs. . . . We have a really hard time recruiting clinicians [in some sites], particularly specialists." "We've had significant membership growth. . . . Most of that membership growth has really impacted our outlying service areas."

In terms of volume, behavioral health was the department with the highest utilization at the time of interview. The tele-stroke program has also been very successful. Kaiser now has a regional team of stroke neurologists who cover all 13 medical centers in their region. As noted earlier, Kaiser also has an asynchronous tele-dermatology service.

#### Mayo

Mayo emphasized that the purpose of their Center for Connected Care telemedicine program is to provide specialty services in areas that are some distance from their larger hospitals so they can keep patients in their home community and reduce or eliminate the need for specialists to travel to other cities. The central practice leadership team decides which locations and what types of telemedicine services to provide at these locations.

#### UMMC

UMMC built their telemedicine network predominately around services provided through their ED and psychiatry departments. These services, which are difficult to provide in rural markets, can be effectively delivered in these areas through telemedicine platforms. UMMC's program began with audio-visual capabilities for tele-ED funded through a grant. There were six tele-ED sites in 2003. Tele-psychiatry was added in 2008. As noted above, at the time of the interview, UMMC provided telemedicine services in 64 of Missouri's 82 counties.

### **Interview Theme: Organic versus Strategic Growth**

Typically, development and growth of telemedicine services within these organizations has not been the result of organizational-level strategies and initiatives. Rather, service development has been primarily organic: addressing specific community requests and needs and/or fostered by physicians with a strong belief in the efficacy of telemedicine.

#### Kaiser

Growth has depended mainly on the interests of the providers in a specific geographic service area and the needs of the patient population in that area. Currently, Kaiser's provider organizations within each region, and across regions, have a great deal of independence in terms of how they develop telemedicine. If one or two providers really want to try telemedicine and believe there is a value added, Kaiser will encourage other providers to participate. Without providers' belief that the service adds value, the service is unlikely to move forward. Kaiser has found that clinics in outlying and lower

socioeconomic areas are the most likely sites to push for implementation of telemedicine services to meet the specific needs of their patient populations.

#### Mayo

As noted above, Mayo's central practice leadership team determines telemedicine services and locations. Physicians may elect to participate in telemedicine services, but are not required to do so. Mayo began with a patient portal and then developed a consult service for asynchronous consultation between specialists and between primary care providers and specialists at different sites. Initially, they also supported a "micro-consult" service, which was a real-time provider-to-provider service that connected primary care physicians with specialty physicians. Although the telemedicine program has grown, Mayo decided to discontinue their micro-consult service because there was not enough volume and the real-time aspect interfered with the physicians' other duties.

#### UMMC

Much of UMMC's initial funding was in the form of a grant from the Bower Foundation to connect rural EDs to the Level I trauma center. The foundation contributed \$750,000 the first year and later contributed another \$750,000, for a total contribution of \$1.5 million.

UMMC's telemedicine services have increased in part because hospitals with which UMMC developed relationships for tele-ED asked for telemedicine services to address other needs, for example, services for stroke patients. Although UMMC does have a business development officer who travels through the state and attends conferences and other meetings to engage potential clients, UMMC understands the importance of getting buy-in from the community for the telemedicine program to be viable. Oftentimes when UMMC markets to smaller facilities, the UMMC staff encourage the local provider to identify the specific services it needs so that UMMC does not appear to be trying to take business away from the local hospital. One informant stated, "The reason I think the program has grown here and been so successful and gotten to be able to cover the state the way it has is because it's been all based on needs."

Related to this, UMMC recognizes that they cannot handle all the patients in the state. If other hospitals and physicians see UMMC as taking away patients, they may decide to leave the community, leaving a void in health care services in remote communities. Further, UMMC appears to see their mission more broadly than just providing health care. One informant stated that he believes that keeping community hospitals viable supports the financial viability of the community. This informant noted that admissions in the community hospitals have increased about 20 percent since they implemented tele-ED, due to the ability to stabilize patients and keep them in the community through tele-ED services.

#### **Interview Theme: Cost Minimization over Revenue Generation**

All three organizations consider telemedicine more as a cost minimization strategy than as a strong revenue generator.

#### Kaiser

The Kaiser informants stated that one of the advantages of being an HMO is that Kaiser has some flexibility in experimenting with some delivery options without necessarily having to bill for them. Informants acknowledged that while not billing patients for telemedicine services is not detrimental from a current organizational standpoint, the billing model would have to change in the future in order to remain sustainable.

### Mayo

Mayo has a fee structure that establishes different payment for synchronous, asynchronous, and tele-ED services, but informants were unable to provide detail on that structure.

### UMMC

Related to the growth of other telemedicine services beyond tele-ED, the informants at UMMC stated, "It was not a financial model for sure." "We are not making any money off of it. I guess on the back end we were because UMMC is the only Level I trauma center in the state, so those patients would end up here anyway. What tele-ED did was it allowed our physicians to take part in stabilizing the patients. After UMMC stabilized them, those patients might've been able to stay in their community hospitals as opposed to coming here. Then if they did need to be transferred here, they were in better condition when they made it here." By stabilizing the patient in the local community hospital, UMMC saves the costs of transferring and treating the patient at the Jackson medical center, uses the trauma center's resources more efficiently, and helps the rural community hospitals to remain financially viable.

In contrast to the findings in our literature review, UMMC's telemedicine program has been profitable in the past and they expect to continue to be profitable. One program UMMC is developing and expects to be profitable is chronic care management remote monitoring. This service is driven by nurses, but also involves pharmacists and social workers.

### **Interview Theme: Staffing, Equipment, and Other Issues**

The three organizations noted that the introduction and growth of telemedicine services also presents a number of new challenges, including staffing and technology issues.

### Kaiser

Kaiser initially used technology that allowed physicians to access telemedicine services only within the Kaiser Permanente system. More recently, technology and security improvements have increased overall utilization of virtual care by allowing physicians to provide services directly to patients in the patient's home.

For tele-stroke, they now have one stroke neurologist dedicated to tele-stroke calls. Some services, such as tele-dermatology, can now be provided from the physician's home. Physicians are able to access the Kaiser network remotely from their laptop and are equipped with a camera, speaker, and microphone to communicate. One operational question raised by this capability is how to equitably compensate physicians who are able to take calls from home compared to on-call physicians who are required to come back to the hospital to treat patients (e.g., on-call surgeons are required to come in and submit documentation in order to be paid).

Kaiser's information technology (IT) services are essentially a separate entity that is organized at the local, regional, and national levels. The informants we interviewed report to the region, although one of the individuals also has national-level responsibilities. Currently, a lot of the overall strategic programming of infrastructure is developed at the national level; however, much of the operational strategy is still set regionally.

The informants did not have a good estimate of how much Kaiser has invested financially in these services. They stated that it varies greatly depending on the region and the specific medical center.

## Mayo

Mayo provides a tele-neonatology service operating on an on-call schedule; but, for most of the other services, providers are contemporaneously engaged in other work in addition to their telemedicine activities.

The focus of the interview was on the Rochester medical center; however, the informants mentioned that the Scottsdale medical center has a tele-stroke program that is staffed 24/7 because of its high volume.

The informants did not provide much information regarding equipment except to state that in rural areas there are challenges around bandwidth and connectivity. There are also challenges related to staffing to address technology needs in rural areas.

## UMMC

The physicians providing tele-emergency services work in a separate area of the ED set aside for tele-emergency. Between consultations, the ED physicians assigned to tele-ED treat non-emergent patients who they can leave if necessary, or they do administrative work if there are no patients to see.

Some of the EDs in the smaller hospitals participating in UMMC's tele-ED program are staffed by family medicine physicians or nurse practitioners (NPs) who are in charge of treating both ED patients and caring for inpatients and may not be comfortable treating some emergency patients. Prior to tele-ED, rural sites would often transfer patients to UMMC to be stabilized; then once the patient was stabilized at UMMC he or she would be sent back to the community hospital. This practice was not an efficient use of resources, nor was the patient's time in the UMMC ED a good use of a Level I trauma center. Tele-ED allows UMMC physicians to provide guidance so the local provider can stabilize patients in the smaller community hospitals without transferring them to the Level I trauma center. This improves patient satisfaction without sacrificing quality as well as providing more revenue for the local hospital.

UMMC has two models for supporting tele-ED. For EDs that are staffed by physicians, UMMC acts as a consultant for physicians who may need assistance from UMMC's ED physicians for a specific patient. Physicians are able to call UMMC whenever an emergency patient comes in and the physician wants some guidance on how to stabilize and treat the patient. The second model supports NPs who are staffing the local ED by themselves. Under Mississippi's collaborative practice regulations, NPs can practice in the ED without physician supervision within certain parameters; but for certain conditions, an NP who is alone in the ED is required to connect to UMMC's ED. In addition, an NP can connect to the UMMC ED regarding other patients for which the NP wishes to have physician support.

For the NP model, when UMMC signs a tele-ED contract, the local hospital is required to identify an NP who will go to UMMC for formal training in the ED. This training builds competence for providers at the local hospital in the use of the telemedicine equipment and procedures. The requirement also builds confidence in the NP on the part of the UMMC providers who will be interacting with the individual. The length of NP training for tele-ED is about nine months. However, the NP does the didactic portion on his or her own timeline as a self-study. After the NP has completed the didactic portion, he or she goes to UMMC for the clinical portion. It was not clear how long the UMMC-based training is. The physician model does not require the same formal training. In that model, UMMC IT staff go to the local hospital to train the physicians on the technology. The physician on duty at the local hospital then decides when to ask for support from UMMC ED physicians.

The basic ED cart costs about \$20,000, but the complete cart with everything that UMMC prefers an ED to have costs about \$35,000. For providers accessing UMMC only for tele-psychiatry, all that is needed is a WebCam and a computer. UMMC makes sure the brand of equipment is consistent across sites. Sometimes UMMC buys the equipment and sometimes the local facility purchases it. When a telemedicine site goes live, a UMMC IT staff member and a clinical staff member go to the site to assist the go-live. The informants noted that there are several governmental entities, for example, the U.S. Department of Agriculture (USDA), that are interested in spreading the technology and have made grants available to purchase telemedicine equipment. The USDA Community Facilities Direct Grant and Loan Program, through its Rural Development Program, will support grants and loans to install equipment and service lines to support telemedicine (<https://www.rd.usda.gov/programs-services/community-facilities-direct-loan-grant-program>).

As noted, UMMC provides tele-ICU on its main campus and for one of its two satellite hospitals. The tele-ICU monitors all 92 beds at the medical center. Critical care nurses staff the tele-ICU 24/7. These nurses can help run a code long distance and do all the documentation. They can also help do the required skill check offs before new nurses can take patients. With the camera they can, for instance, watch a nurse do a Foley catheter or a sterile dressing change and give the nurse support, if necessary, or document that the nurse has the skills needed. The nurses are required to have five years of critical care experience, although the average experience of these nurses is 23 years. The informants state that the tele-ICU and tele-ED services are a way to keep experienced nurses in the field longer as the work becomes more physically challenging. UMMC also has monitor technicians for remote telemetry.

The informants pointed out that tele-ICU equipment is expensive (\$12,000 per bed) to install and does not really decrease staffing. It may decrease length of stay and increase quality; however, the expense makes it difficult to convince smaller hospitals that it is a wise investment when it does not reduce the nurse staffing level. For tele-psychiatry and tele-cardiology, UMMC physicians have blocked time and work from their offices for those services.

In order to maintain staff competency at the tele-ED site, UMMC provides quarterly education through an e-learning system and employs an internal evaluator. UMMC also supports local sites through an external educator who goes to the sites to make sure that staff members are up-to-date on their skills. This helps them address skill loss due to turnover and infrequent use of the carts.

### **Interview Theme: Further Uses Considered (as of September 2016)**

All three organizations are considering the future of their telehealth services, including service expansion in both scope and geography.

#### Kaiser

As noted above, the Kaiser informants stated that Kaiser is replacing its former organic approach to expanding telemedicine services with a more strategic approach. For example, Kaiser wants to have telemedicine services available in all 13 of the region's service areas, not just one, partly because some patients move across the boundaries of the areas when they are seeking care. In pursuit of this, Kaiser is working with the chiefs of the departments in each service area to develop shared clinical criteria and a more standardized approach for their service offerings to better market and advertise telemedicine services to their members. They are specifically looking at tele-ICU and increased ED support.

Kaiser has also begun conducting patient ethnographies to better understand how specific patient groups relate to telemedicine services. For example, they noted that many Hispanic members seem to prefer face-to-face encounters. The informants stated that they hope that as more health care providers adopt telemedicine services, patients and providers would be more likely to use these services.

The informants also stated that Kaiser would like to be able to provide almost any service that essentially entails monitoring in the home. Kaiser is trying to answer the following questions relative to developing other new services: What is the workflow that they are hoping to achieve? How are technology, space, etc. supported?

#### Mayo

Mayo expects the future to include more remote monitoring and more mobile access. Some of the smaller hospitals with which Mayo has telemedicine contracts have asked for a hospitalist service, but at the time of the interview, Mayo had not yet decided whether to provide this type of service to these sites.

#### UMMC

UMMC's telemedicine strategic plan is to provide services in all 82 Mississippi counties. UMMC's tele-ICU will soon begin monitoring nine beds in their satellite hospital in Grenada, Mississippi, located two hours north of the main campus. UMMC believes the reputation and skills available in an academic medical center are a way to differentiate itself from other organizations trying to provide telemedicine services.

UMMC has a great deal of patient-level data through the Mississippi Health Information Exchange network and through the EpicCare link. UMMC asks the community hospitals with whom they have telemedicine contracts to enroll as providers in the EpicCare link so that they can securely communicate synopses of patient status with them. A side benefit of this is that UMMC analysts are able to examine data from EpicCare to better document what services UMMC is providing in each county to which types of facilities.

Currently one area of emphasis is remote patient monitoring for chronic disease management to help community hospitals reduce penalties for readmissions. The financial model for this is for UMMC to provide the remote monitoring and let the community hospital bill for it. UMMC is also looking at remote patient monitoring outside of Mississippi. Their remote monitoring staff and technology can handle up to 1,200 patients, but at the time of the interview, only about 120 patients were enrolled. Telemedicine staff members not actively engaged with treating patients were working on enrolling new patients.

Potential competition is a concern for UMMC. The informants stated that health care systems in other states are becoming very aggressive. For example, these systems help small hospitals connect to Epic at a reduced rate, thereby gaining access to data that they can then use for competitive advantage. Another concern expressed by the informants is direct-to-consumer companies marketing directly to consumers/patients. UMMC avoids direct marketing to consumers/patients because they do not want to be seen as competing with local hospitals and local clinics.

Licensing to provide services across state lines is another area of policy concern. Currently, there is a 29-state compact for licensing of nurses (<https://www.ncsbn.org/nurse-licensure-compact.htm>) that will allow UMMC to

provide tele-ICU across state lines. Physicians wishing to practice in multiple states can get expedited licensure through the Interstate Medical Licensure Compact (IMLC), see <https://imlcc.org/> (it also covers 29 states). The nursing compact is overseen by the Federation of State Medical Boards (FSMB). The American Telemedicine Association is working to create a similar interstate compact license for physicians and NPs as well.

## Summary and Conclusion

The purpose of this project was to explore organizational motivations for incorporating telemedicine into patient care services. Our work included a literature search and interviews with individuals at three organizations: Kaiser Permanente Southern California (Kaiser), Mayo Clinic Center for Connected Care (Mayo), and the University of Mississippi Medical Center (UMMC). Five primary themes emerged.

First, the organizations established telemedicine to provide specific specialty services in geographic areas where it is hard to recruit physicians. Second, telemedicine grew more organically than strategically. New services and services to new communities focused on needs identified by local providers that would keep patients in their home communities and reduce travel costs for patients and providers rather than on revenue generation. Indeed, consistent with the literature, only one of the three organizations, UMMC, stated that their telemedicine program was profitable. Third, a more strategic approach to growth is a theme that emerged from the interviews. All three organizations now see telemedicine as a mechanism to retain and build market share by retaining patients in the host organization's system of care and keeping and expanding referrals from providers in these communities. For example, all three organizations expressed interest in home monitoring for patients with chronic conditions. In a fourth theme, all three organizations noted that the development and growth of telehealth services has introduced new technical and staffing challenges. Finally, all three organizations are considering the future of their telehealth services, including service expansion in both scope and geography.

Given the organizational, governance, operational, and geographic differences of these organizations, it is not surprising that these themes play out differently. UMMC interviewees see part of their organization's mission as a state institution and the state's premier trauma center as service to the entire state. Thus, their primary approach to tele-ED is to respond to requests from small community providers to keep emergency patients in their home communities. This has had the positive collateral effect of supporting the financial well-being of the local hospital. Kaiser and Mayo focus more on the needs of their own institutions and those with whom they have a formal alliance. Interestingly, only UMMC discussed the positive return on their investment. Retaining patients (Kaiser) and referrals (Mayo) and reducing the need for specialists to travel appear to be motivations for their telehealth services.

In the shift to a more strategic approach to telemedicine, Kaiser and Mayo had decided to centralize at least some of the telemedicine planning. Kaiser, as an integrated system, appears to be attempting to standardize the services offered across the entire division and to roll out new services based on the greatest potential for impact for their enrollees. Mayo had centralized the decision process about telemedicine service offerings in their central practice leadership team. At the time of the interviews, all three organizations primarily offered telemedicine services that addressed episodic care, such as tele-ED, tele-stroke, tele-psychiatry, and tele-dermatology. Looking forward, all three expressed the desire to develop monitoring services for patients with chronic conditions. UMMC was actively moving into that area.

Some limiting aspects of this project should be noted. First, the focus was on real-time services offered by large hospitals to rural hospitals, principally those with whom they had established relationships. Telemedicine services provided directly to consumers/patients were only addressed to the extent they were discussed in the limited literature reviewed or mentioned by informants. When informants mentioned providing telemedicine services directly to patients, it was mainly in the context of future plans for in-home chronic care patient monitoring. Second, informants at only three organizations were interviewed. While this limits generalization, the interviews were generally consistent with the literature. Third, while none of the interviews directly addressed the issue, it is worth noting that the medical staff at each of the organizations is composed primarily, if not exclusively, of physicians employed by the organization (as opposed to independent physicians or practice groups working under contract). This is likely to have influenced the strategic and operational approaches the organizations have taken.

Several operational and policy-related issues arise from these interviews. One of the spinoff positives of telemedicine for UMMC is that it allows their schools of pharmacy, medicine, and nursing to build telemedicine into their curricula since they believe this mode of delivery is likely to become more prevalent in the future. Among the questions this belief raises are the following: Should telemedicine be required in the curricula of all health care sciences? Should there be grants to support infrastructure in teaching hospitals? Should telemedicine be built into licensing and board examinations?

Some of the hospital clients have requested intensivist services (hospitalists or tele-ICU). While these services have the potential to improve quality and shorten length of stay, the infrastructure for these services is very expensive and they do not reduce staffing needs.

There are a number of policy questions about building the infrastructure for telehealth services, including the following: What are the financial obligations of Federal and State government and insurers? How should the funding be made available? What are the criteria for receiving funding? What licensing or accrediting regulations need to be in place?

All three organizations expressed a desire to provide home monitoring services. For an integrated delivery system like Kaiser, such services can prevent acute occurrences that may result in procedures or hospitalization. For fee-for-service organizations, home monitoring services can keep patients in their system and avoid unnecessary readmission penalties. Some of the questions related to home monitoring services include the following: What regulations should there be for offering these services across state lines? Should there be different regulations for integrated delivery systems, or accountable care organizations, that operate across state lines versus independent providers (hospitals or physicians or NPs)? Who should set the standards for quality?

It is clear that there is significant variation in organizational motivation for developing telehealth services. These motivations can be impacted by local and regional market conditions, system and regional economics, and institutional mission. While health care organizations are increasingly employing telemedicine to address the challenge of providing access to appropriate health care services in rural and remote communities in the U.S., it is clear that telemedicine is not a panacea. Both our review of the literature and the results of our interviews show that successful growth in telehealth services is likely to be measured and deliberate.

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